Missouri Department of Natural Resources' Response to Comments from Keith Piontek
March 2006

1. The MRBCA Technical Guidance for Tanks includes a soil vapor sampling protocol. It is my understanding that this protocol will be incorporated into the Departmental MRBCA Technical Guidance as Appendix H. However, there may still be a gap in the Departmental Technical Guidance concerning evaluation of the vapor intrusion pathway. The MRBCA Technical Guidance for Tanks also included a discussion of the manner in which the vapor intrusion pathway should be evaluated (Appendix C). To my knowledge, there is no equivalent of Appendix C in the Departmental MRBCA Technical Guidance. Section 6.14 of the Departmental MRBCA Technical Guidance includes a statement that soil vapor monitoring may be conducted, but to my knowledge there is no discussion in the guidance as to how results from such monitoring would be evaluated.

DNR Response: We apologize for any confusion on this issue. This issue has been handled in the Tanks Section of the Hazardous Waste Program and the Vapor Pathway Subgroup. The intent all along has been to adopt its entire methodology, as you also suggest. Minor revisions in wording have been made to reflect its application to a broader range of sites. We have incorporated Appendix C as Appendix H, and the Standard Operating Procedure (SOP) is posted on the MRBCA website at the following address: http://www.dnr.mo.gov/alpd/hwp/tanks/mrbca-pet/mrbca-pet-tanks.htm

2. The MRBCA Technical Guidance for Tanks describes the use of the MRBCA computational software to derive soil vapor target levels. It is my understanding that the vapor migration equation used in the software neglects advection of vapors into an enclosed space (which could potentially result, in part, from the "stack effect"). This is appropriate for situations which are diffusion-controlled (e.g. release of vapors from deep impacted groundwater). However, it is my understanding that soil vapor samples are intended to be collected in locations that are in close proximity to floor slabs or basement walls of existing structures or structures that could be built in the future. Vapor migration in these locations could very well be within a structure's zone of advective influence. To my knowledge, this specific vapor migration scenario and the associated use of the software to derive soil vapor target levels was not discussed in the stakeholder process. If it is DNR's intent to incorporate the equivalent of Appendix C of the Tanks Guidance into the Departmental MRBCA Technical Guidance, it may be prudent to consider and clarify the applicability of the "no advection" assumption in deriving soil vapor target levels.

DNR Response: These issues were handled by the Vapor Pathway Subgroup, which was coordinated by the Tanks Section. This issue has been referred to the Tanks Section for its consideration.

3. It is my understanding that the latest version of the DNR Soil Gas Sampling Protocol (to be inserted into the Departmental MRBCA Technical Guidance as Appendix H) is the version dated April 21, 2005. Section C.4.1.B of that protocol requires the purging of three "sampling system volumes", with that volume including the filter pack void space. This is an excessive purge volume for probe points that have been allowed an adequate period of time to equilibrate with the subsurface. The larger the purge volume, the greater the likelihood of "breakthrough" from the atmosphere into the probe; thus, excessive purge volumes may do "more harm than good". Discussions between DNR technical staff and Blayne Hartman (nationally recognized expert on subsurface soil gas sampling) may be the most expeditious way of resolving this issue.

DNR Response: Adequate purging of the sampling equipment is essential to collect a soil vapor sample that is representative of the soil vapor concentrations and not diluted by residual air in the sampling equipment. In situations where removal of three sampling system volumes will cause (breakthrough) ambient air to be sucked in, the remediating party should contact DNR and suggest alternative purging volumes or suggest that the location of sampling be moved. The MRBCA process is flexible in that it allows deviations from this condition if adequately supported by technical considerations, which should be documented prior to performing the work in an approved work plan.

4. Section 8.8 of the Departmental MRBCA Technical Guidance technical deals with the "possible requirement" to compute cumulative risk and hazard index at Tier 1. It is my understanding that this particular process burden is not typically required at Tier 1 in other RBCA processes, and if required would add complexity to a Tier 1 process that is already more burdensome and less efficient than was desired at the outset of the MRBCA stakeholder process. The probability that a site otherwise meeting all Tier 1 criteria would pose an unacceptable risk due to cumulative risk seems remote at best. It appears that DNR's rationale for including this potential requirement is that it could be required at highly complex Superfund-type sites. With the decision to exempt Superfund sites from the MRBCA process, perhaps this potential requirement can now be deleted from the process.

DNR Response: **Only sites listed on the National Priorities List (NPL sites) will be exempted use of Missouri's MRBCA process; therefore, many Superfund sites can be handled by MRBCA. In order to simplify this calculation, the department has included spreadsheets in the Technical Guidance to perform this exercise, and we will make the electronic spreadsheet available on the MRBCA website.**

5. In the 12/16/05 letter with "final DNR responses to EPA comments" that was handed out at the recent stakeholder meeting, DNR makes a case that the construction worker soil ingestion rate should be 40-50 mg/day. The supporting rationale strikes me as sound, and I support this recommendation.

<u>DNR Response:</u> Thank you for bringing this issue to our attention, which was discussed in our letter to the USEPA of December 16, 2005. To be consistent with the discussion in that letter, the department will adjust the construction worker soil ingestion rate to 49 mg/day.